

Appl. No. 09/324,149
Amdt. dated June 18, 2004
Reply to Office Action of October 21, 2003

PATENT

REMARKS/ARGUMENTS

This Amendment is responsive to the Office Action mailed on October 21, 2003. A Notice of Appeal was filed on March 22, 2004. An RCE (Request for Continued Examination) and a petition for a 1-month extension of time are being filed herewith. This Amendment is being timely filed and entry of this Amendment is requested.

Prior to this Amendment, claims 1-23 were pending. In this Amendment, claims 24-28 are added so that claims 1-28 are pending and subject to examination.

Applicants' representative requested a telephone interview with the Examiner to discuss the Office Action as well as the Advisory Action mailed on February 23, 2004. However, the request was denied, since the pending claims are finally rejected. As noted above, Applicants are submitting an RCE (Request For Continued Examination) to re-open the prosecution of this case. Applicants again request an interview with the Examiner and request that the Examiner contact the undersigned to schedule a mutually convenient time to discuss the issues in this case.

The Office Action contains a number of rejections. Each rejection is addressed in the order presented.

I. Jaskie

Claims 1-6, 12-15, and 17-22 are rejected as anticipated by Jaskie (U.S. Patent No. 5,442,254). This rejection is traversed.

A. Independent claim 1

Jaskie fails to anticipate or obviate the pending claims. Here, Jaskie fails to teach or suggest an apparatus including, *inter alia*, "an array of semiconductor nanocrystals forming a pixel array of different colors, wherein the sizes of the nanocrystals determine the colors" as recited in independent claim 1. In a Request For Reconsideration filed on January 20, 2004.

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Applicants have already provided arguments as to why claim 1 is patentable over Jaskie. Those arguments are incorporated herein by reference.

In response to Applicants' previous arguments for patentability, the Advisory Action mailed on February 23, 2004 states that the "Examiner notes that the claims of the instant application [do] not require a pixel array in the nanocrystal array. The Examiner notes that independent claim 1 recites a pixel addressing system associated with the nanocrystal array for selectively exciting the nanocrystals to produce a luminescent color pattern of pixels."

In response to the Advisory Action, Applicants have amended claim 1 to indicate that the apparatus includes "an array of semiconductor nanocrystals forming a pixel array of different colors." Accordingly, to the extent that the Examiner believed that previously submitted claim 1 did not positively recite the phrase "pixel array", Applicants believe that amended independent claim 1 now clearly recites this feature. Claim 1 should be patentable over Jaskie for the reasons provided in the Request For Reconsideration.

In addition, in the Office Action, the Examiner refers to FIGS. 3-5 of Jaskie as teaching a "pixel addressing system" that is "operatively associated with the nanocrystal array for selectively optically exciting the nanocrystals to produce a luminescent color pattern of pixels." However, none of these embodiments mention a "nanocrystal array" or a "color pattern of pixels" as alleged in the Office Action. In fact, Jaskie fails to mention the word "pixel" at all.

FIG. 3 shows a "fluorescent bulb" (c. 3, l. 40-41), which uses the fluorescent screen in FIG. 2 (c. 7, l. 53-55). FIG. 4 shows a "CRT" or cathode ray tube (c. 3, l. 42-46). The CRT 50 in FIG. 4 includes a layer 53 of fluorescent material, which includes the particles described in conjunction with FIG. 2 (c. 7, l. 67 to c. 8, l. 3). The embodiment in FIG. 5 of Jaskie is the same as the one in FIG. 4, except that an array of FEDs is used instead of a thermionic cathode. Thus, the three embodiments cited by the Examiner and shown in FIGS. 3-5 use the fluorescent screen in FIG. 2 of Jaskie.

The fluorescent screen 20 in FIG. 2 is made by the following process (see col. 6, lines 30-38 of Jaskie):

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Plurality of quantum contained particles 26 are fixedly deposited on the surface of substrate 22 by any convenient means such as: a thin film of uncured, optically clear plastic which is spread on the surface, particles 26 are spread over the surface of the thin film and the film of plastic is cured; an adhesive; a solution of material, e.g. magnesium oxide hydrate, and particles 26 are used to form layer 24 on substrate 22, after which the solution is allowed to dry; etc.

As indicated by this passage and referring to FIG. 2 of Jaskie, particles 26 are "spread" over the surface of a substrate using a solution including the particles 26. The formed layer 24 is then dried. As illustrated by the cross-sectional view in FIG. 2, the particles 26 are somewhat randomly oriented in the layer 24 and are not arranged in a pixel array as in embodiments of the invention (compare FIG. 2 of Jaskie with the Figures in the present application). Jaskie discloses only one manufacturing process for his fluorescent screen, and that process clearly does not result in "an array of semiconductor nanocrystals forming a pixel array of different colors" as recited in independent claim 1.

B. Independent claim 24

Jaskie also fails to teach or suggest an apparatus including, *inter alia*, a nanocrystal array forming an array of pixels, wherein the array of pixels comprises a first discrete pixel comprising first nanocrystal particles of a first size and a second discrete pixel comprising second nanocrystal particles of a second size, and wherein a pixel addressing system is adapted to excite the first nanocrystal particles in the first discrete pixel "using light comprising a wavelength to cause the first pixel to produce a first color and to excite the second nanocrystal particles in the second discrete pixel using light of the same wavelength to cause the second discrete pixel to produce a second color" as recited in independent claim 24.

First, as noted above, Jaskie does not teach or suggest "a nanocrystal array forming an array of pixels". At best, Jaskie describes depositing particles on a substrate in a somewhat random fashion to produce a phosphor layer. The nanoparticles are not in an array, let alone a pixel array. As noted above, Jaskie fails to recite the word "pixel" at all.

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Since term "pixel" is not present in Jaskie, the Examiner may believe that any location on Jaskie's phosphor screen is a "pixel". Even under this broad interpretation, Jaskie would not teach or suggest a pixel addressing system that is adapted to excite first nanocrystal particles in a first discrete pixel "using light comprising a wavelength to cause the first pixel to produce a first color and to excite ... second nanocrystal particles in the second discrete pixel using light of the same wavelength to cause the second discrete pixel to produce a second color." As evidenced by Jaskie's method of manufacture, if Jaskie has pixels at all, the same types of nanocrystals would present in the alleged pixels. Applicants submit that the stimulation of any particles in such alleged pixels in Jaskie would produce the same colors, and not different colors. Put another way, the phosphor layer in Jaskie is, at best, homogeneous in its luminescence, *i.e.*, it produces one color. Accordingly, even under a broad interpretation of the term "pixel" where different regions of Jaskie's phosphor screen are different "pixels", the different "pixels" would not produce different colors. Accordingly, Jaskie's pixel addressing system would not be adapted to excite first nanocrystal particles in a first discrete pixel "using light comprising a wavelength to cause the first pixel to produce a first color and to excite ... second nanocrystal particles in the second discrete pixel using light of the same wavelength to cause the second discrete pixel to produce a second color" as recited in independent claim 24.

II. Jaskie, Yagyu, and Bhargava

Claims 7-11 and 23 are rejected as obvious over Jaskie and Yagyu (U.S. Patent No. 5,856,814). Claim 16 is rejected over Jaskie and Bhargava. These rejections are traversed.

Applicants submit that the primary reference, Jaskie, is deficient for the reasons provided above, and that the additional citations of Yagyu and Bhargava fail to supplement to the deficiencies of Jaskie.

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CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 415-576-0200.

Respectfully submitted,



Patrick R. Jewik
Reg. No. 40,456

TOWNSEND and TOWNSEND and CREW LLP
Two Embarcadero Center, Eighth Floor
San Francisco, California 94111-3834
Tel: 415-576-0200
Fax: 415-576-0300
PRJ:prj
60240832 v1